Analysis of Physical Activity Against Stress Levels in Pregnant Women at Plaju Health Center

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Abstract **-** Energy expenditure by skeletal muscle movements includes light, moderate, heavy, permanent, household, work and sports activities. Pregnant women with excessive physical activity cause tired then affect the stress level. Conditions of anxiety or anxiety to feeling depressed during pregnancy can activate the hormone cortisol in the bodyand cause complications in pregnancy and infant growth. The purpose of the study is analyzing the physical activity of pregnant women towards stress levels at the Plaju Health Center in Palembang. This quantitative research used cross sectional study design. 156 trimester II and III pregnant women were taken by purposive sampling at the Plaju Public Health Center. The results showed a significant relationship between physical activity (p-value = 0.035), gestational age (p-value 0.002), occupation (p-value 0.001), income (p-value 0.018) and history of disease (p-value 0,000) on stress levels in pregnant women. The results of multivariate analysis found that the most dominant variable affecting stress levels in pregnant women was physical activity that had been controlled by confounding variables, namely gestational age, occupation, and disease history ((PR = 2,225, 95% CI = 1,096 – 4,776). The results showed that pregnant women working with excessive physical activity at the third trimester of pregnancy who have a history of the disease have a higher risk of being exposed to stress in pregnancy. Plaju Health Center is expected to open counseling especially for pregnant women who work on the balance of physical activity by paying attention to gestational age, history of illness to reduce stress levels.

Keywords: physical activity, stress level
literature: 75 (1997-2019)

1 INTRODUCTION

Maternal Mortality Rate (MMR) describes the number of women who died related to pregnancy disorders or treatment (not including accident or incidental cases) during pregnancy, childbirth and in the postpartum period, 42 days after delivery.(Kemenkes, 2015) The most common causes of maternal death in Indonesia are direct obesity with bleeding 28%, hypertension 24%, infections 11%, while indirect causes are trauma 5% obsetri etc. 11%(Profil Kesehatan Indonesia, 2017)

Regarding the issue of maternal mortality, the community is suing that the target of the Sustainable Development Goals (SDG's) in 2030 needs to receive special attention from all parties, both the government and the private sector, namely reducing the Maternal Mortality Rate (MMR) below 70 pregnant women per 100,000 live births. Data from the National Medium-Term Development Plan (RPJMN) in 2010 reached 346 per 100,000 live births, the target of the RPJMN in 2011 was 306 per 100,000 live births according to the Directorate of Maternal Health Development of the Ministry of Health of the Republic of Indonesia. (Riset Kesehatan Dasar, 2018). Pregnant women are one of the groups in society who suffer the most from health problems. During pregnancy, pregnant women will experience physical and psychological changes (feelings of anxiety, fear, stress, to stress)(Guiton, 2008). Stress is the process by which environmental demands exceed the ability or source of an individual to overcome them which results in psychological changes (Perceived Stress). Perceived Stress is the ability of the brain to receive stimuli or stimuli to pressure or burden that exceeds the ability in one's life, which comes from knowledge and experience to be perceived as stress (Bruce, 1998) The source of stress, called a stressor, can come from psychological factors such as social relationships or life changes such as pregnancy or daily physical activity to life problems(Folkman, S., & Lazarus, 1985)

Physical activity is classified as mild, moderate, heavy, household, sedentary, work and sports. The combination of these activity classifications is referred to as total physical activity. Light physical activity is defined as body movements in daily activities such as housework and walking. Physical activity is being defined as body movements such as cycling, jogging, and walking fast. Heavy physical activity is body movement that requires burning large calories such as swimming, hiking and lifting weights (Ml, 2019).

Physical, emotional and social changes in pregnancy can be stressors, as well as worries about childbirth including age during pregnancy, physical changes, appearance, interpersonal relationships, daily work or physical activity, medical conditions during pregnancy or stress and fatigue so mothers become more sensitive to emotional changes that trigger increased stress (Lobel & Dunkel Schetter, 2016).

Occupational factors in pregnant women are one of the factors that can make pregnant women more stressed due to the dual role in work and family. Pregnant women who work for a long duration also affect stress. The longer pregnant women work, the greater the risk for health problems such as work stress. In this case stress can be related to the status of work or physical activity in a day where the status of work and physical activity can affect the level of stress in a person's body associated with the burden of work but stress during pregnancy can also occur directly or indirectly can causecomplications pregnancy. Stress increases activation of the sympathetic nervous system. Stress causes the active sympathetic nervous system to stimulate the hypothalamus to release the hormone corticotropin-releasing-factor (CRF), the pituitary releases the hormone adenocorticotropin (ACTH) and ACTH stimulates the adrenal glands to release adrenaline (epinephrine) to produce cortisol. Overactive sympathetic nervous system becomes a risk factor for preeclampsia to hypertension(Kordi*et al.*, 2017).

Pregnant women who experience stress can cause the release of the hormone cortisol. The hormone cortisol itself has an effect in inhibiting the flow of blood to the fetus which can cause interference with the development of the baby (Folkman, S., & Lazarus, 1985). Stress during pregnancy increases the risk of 1.6 times greater for hypertension and 2.9 times the risk

of preeclampsia in pregnancy (Kordi *et al.*, 2017)). Pregnant women who are severely depressed will be at greater risk of preeclampsia (OR = 3.2) compared to moderately depressed pregnant women (OR = 2.3) (Qiu *et al.*, 2008). During 2006 to 2017 the coverage of K4 pregnant women health services tended to increase. When compared with the Ministry of Health's Strategic Plan (Renstra) target of 2017 which is 76%, the achievements in 2017 have reached the target. The highest K4 coverage is in the DKI Jakarta province while South Sumatra is ranked fifth (Riset Kesehatan Dasar, 2018).PlajuPuskesmas is one of the Puskesmas that has the highest number of visits of pregnant women in Palembang, reaching1.682 pregnant women1.682who visited. (Profil Kesehatan Palembang, 2017). Based on preliminary surveys at the Plajupuskesmas, the number of visits of pregnant women in 2018 was 1082, then an increase in the number of visits of pregnant women from January to March 2019 was 1050 pregnant women. Based on the statement above it is known that physical activity plays a role in the emergence of stress levels in pregnant women which may cause indications of complications in pregnancy. Excessive physical activity in pregnant women to experience fatigue, anxiety, stress, anxiety can be called an indication of the risk of risk of placental hypoxia or disruption of uteroplacental blood flow so that the blood volume to the placenta is reduced and oxygen levels carried to the uterus decrease resulting in perfusion of the atherial spirals causing hypertension in pregnancy, preeclampsia bleeding to eclampsia in pregnant women that cause death is a problem that always occurs in pregnancy so the above explanation is an indication of the importance of conducting a study entitled "Analysis of Physical Activity Against Stress Levels in Pregnant Women at PuskesmasPlaju Palembang"

2.RESEARCH METHODS

2.1 Study Design and Data Collection

This research is a quantitative method research with cross sectional analytic survey approach, which is a study to study the correlation between the dependent variable (stress level) and the independent variable (physical activity of pregnant women). The locationof the study was conducted in the palembangplaju community health center. The populationin this study was pregnant women withinscope ofthe plaju health center in palembang during the study. The sample size is calculated using the formula of the sample size of the cross-sectional hypothesis test design, then obtained a sample of 72 multiplied by 2 to 144the sample. 10% drop out was added so that the number of samples became 156 samples.

2.2 Sampling Techniques

Questionnaire to measure the physical activity of pregnant women and is standard, PPAQ (Pregnancy Physical Activity Questionnaire) contains 36 questions to explore the intensity of physical activity during the last 7 days before the time of research. The intensity of physical activity that you want to measure uses ratio data and uses the values set by PPAQ and MET Values for American Activities.

Inclusion Criteria:

1. Pregnant Mother in the Scope of Palembang Public Health Center
2. Pregnant Mother with Trimester 2 and 3 gestational ages

Exclusion Criteria:

1. Pregnant Mother with Trimester 1 gestational age

2.3 Data Collection Techniques

The instrument used to measure stress levels of pregnant women using a standardized questionnaire

that is the Kessler Psychological Sitress Scale (K10) by Kessler R. Professor of Health Care Policy from Harvard Medical School Boston USA consists of 10 questions about anxiety and depression symptoms experienced by a person in the last 4 weeks to look at stress measures. Stress intensity is measured using ratio data.

With ratings:

1 = never

2 = only occasionally

3 = sometimes

4 = often

5 = every time

The number of scores for each answer is added so that 1 questionnaire will have a minimum value of 10 and a maximum of 50.

2.4 Data Analysis

After the data is collected then the data is analyzed using univariate, bivariate and multivariate. Univariate data analysis is used to find out the frequency distribution of the dependent variable, namely the stress level and the independent variable, namely physical activity, pregnant woman's age, gestational age, occupation, income, parity status, disease history, pregnancy exercise. Bivariate analysis is carried out to assess the relationship or influence between independent and dependent variables. The results of the bivariate analysis are presented in the table by displaying the p-value, rario prevalence (PR), and Confidence Interval (CI) of each variable. Multivariate Analysis: in Multivariate analysis researchers used a multiple logistic regression test using a risk factor research model that aims to validly estimate the relationship between the main independent (physical activity) and the dependent variable (stress level) after being controlled by several variables that are suspected of confounding (maternal age pregnant, gestational age, occupation, income, parity, history of illness, and pregnancy exercise).

3. RESULTS

3.1. Univariate Analysis

3.1.1 Characteristics of Research Respondents

After conducting interviews and examinations on 156 pregnant women at the PuskesmasPlaju Palembang, the following results were obtained:

Table 3.1 Frequency Distribution of Dependent Variables and Independent Variables

Variable	Frequency	%
Stress Level		
Stress	89	57,1
No stress	67	42,9
Total Physical Activity		
Over	78	50
Normal	78	50
Sedentary Physical Activity		
Over	78	50
Normal	78	50
Light Physical Activity		
Over	78	50
Normal	78	50
Medium Physical Activity		
Over	74	47,4
Normal	82	52,6
Heavy Physical Activity		
Over	71	45,5
Normal	85	54,5
Household Physical Activity		
Over	78	50
Normal	78	50
Physical Activity Work		
Over	46	29,5
Normal	110	70,5

Physical Activity Sports		
Over	71	45,5
Normal	85	54,5
Age		
High risk	32	20,5
Low risk	124	79,5
Age of Pregnancy		29,5
Trimester 2	46	
Trimester 3	110	70,5
Occupation		55,1
Work	86	
Does not work	70	44,9
Income		57,1
< UMR	89	
> UMR	67	42,9
Paritas		64,1
Primipara	100	
Multipara	56	35,9
Disease History Chronicles	38	24,2
No Chronicles	118	75,6
Pregnancy exercise		9,6
Yes	15	
No	141	90,4

Based on Table 3.1 Pregnant women who experienced stress from 156 respondents by 89 (57.1%), who had total physical activity in excess of 78 (50%), who had excess light physical activity as many as 78 (50%), who had physical activity 78 (50%) excessive sedentary, 74 (47.4%) of moderate moderate physical activity, 71 (45.5%) of excessive heavy physical activity, 78 (50.5%) excessive physical activity of the household %), those who have physical activity in excess of 46 jobs (29.5%), who have physical activity in excess of 71 sports (45.5%), who have a high risk age of 32 (20.5), who have an advanced age trimester 3 110 (70.5), 86 (55.1) working, having 89 <UMR income (89.17), having 56 (35.9) multiparous parity status, having a history of disease chronicles as much as 38 (24.2), which does not accompany pregnancy exercises as many as 141 (90, 4).

3.2 Bivariate Analysis

Table 3.2 Bivariate Analysis of Stress Levels in Pregnant Women in PuskesmasPlajuPakembang

Variable	Stress Levels (%)				Amount	*p-value*	PR (95%CI)
	Low		High		n		
	n	%	n	%			
Physycal Activity							
Over (>144,5)	51	65,4	27	34,6	78	0,035	1,988 (1,044-3,786)
Normal (≤144,5)	38	48,7	40	51,3	78		
Age							
High Risk	18	56,2	14	43,8	32	0,918	0,960 (0,438-2,102)
Low Risk	71	58,1	53	41,9	124		
Age Of pregnancy							
Trimester 2	35	76,1	11	23,9	46	0,002	3,300 (1,522-7,153)
Trimester 3	54	49,1	56	50,9	110		
Occupation							
Work	59	68,6	27	31,4	86	0,001	2,914 (1,511-5,620)
Does not work	30	42,9	40	57,1	70		
Income							
<UMR	58	65,2	31	34,8	89	0,018	2,173 (1,136-4,156)
>UMR	31	46,3	36	53,7	67		
Paritas							
Primipara	55	55,0	45	45,0	100	0,489	1,264 (0,650-2,460)
Multipara	34	60,7	22	39,3	56		
Disease History chronicles	31	81,6	7	18,4	38	0,000	4,581 (1,870-11,224)
No chronicles	58	49,2	60	50,8	118		
Pregnancy exercise							
No	81	57,4	60	42,6	141	0,760	0,847 (0,291-2,463)
Yes	8	53,3	7	46,7	15		

From Table 3.2 it is known that physical activity has a p-value of 0.035 (p-value <0.05) which means there is a relationship between physical activity and stress levels in pregnant women at the Plaju Health Center in Palembang. Prevalence Ratio (PR) value indicates 1988 means that pregnant women who

have physical activity are 1,988 times more at risk of experiencing stress than pregnant women who have normal physical activity (95% CI = 1,044-3,786). The population is believed to be 95% that pregnant women who have physical activity are more at risk of experiencing stress than pregnant women who have normal physical activity with a range of 1,044 to 3,786. Gestational age has a p-value of 0.918 (p-value> 0.05) which means there is no relationship between the age of pregnant women with stress levels in pregnant women at the Plaju Health Center in Palembang. Gestational age has a p-value of 0.002 (p-value <0.05), which means there is a relationship between gestational age and stress levels in pregnant women at the Plaju Health Center in Palembang. The value of Prevalence Ratio (PR) shows 3,300, meaning that pregnant women with trimester 3 gestational age are 3,300 times more likely to experience stress than pregnant women with trimester 2 gestational age (95% CI = 1,522-7,153). The population is believed to be 95% that pregnant women with trimester 3 gestational age are at risk for experiencing stress compared to pregnant women with gestational age trimester 2 with a range of 1.522 to 7.153. Work has a p-value of 0.001 (p-value <0.05) which means there is a relationship between work and stress levels in pregnant women at the Plaju Health Center in Palembang. The value of the Prevalence Ratio (PR) shows the number 2.914 means that pregnant women who work at risk are 2,914 times higher to experience stress than pregnant women who do not work (95% CI = 1,511-5,620). In the population it is believed that 95% of working pregnant women are at risk of experiencing stress compared to non-working pregnant women with a range of 1,511 to 5,620. income has a p-value of 0.018(p-value <0.05) which means there is a relationship between income and stress levels in pregnant women at the Plaju Health Center in Palembang. The value of Prevalence Ratio (PR) shows 2,173 meaning that pregnant women who have an income <UMR are 1,433 times higher risk of experiencing stress than pregnant women who have an income> UMR (95% CI = 1,136-4,156). The population is believed to be 95% that pregnant women who have an income <UMR are at risk of experiencing stress compared to pregnant women who have an income> UMR with a range of 1.136 to 4.156. Parity has a p-value of 0.489 (p-value> 0.05) which means there is no relationship between parity status and stress levels in pregnant women at the Plaju Health Center in Palembang. History of the disease has a p-value of 0,000 (p-value> 0.05) which means there is a relationship between the history of the disease with stress levels in pregnant women at the Plaju Health Center in Palembang. The value of the Prevalence Ratio (PR) shows the number 4.581 means that pregnant women who have a history of chronic disease are 4.581 times higher risk of experiencing stress than pregnant women who have no history of chronic disease (95% CI = 1.870-11.224). The population is believed to be 95% that pregnant women who have a history of chronic disease are at risk of experiencing stress compared to pregnant women who have no history of chronic diseases with a range of 1,870 to 11,224. Pregnant exercise has a p-value of 0.760 (p-value> 0.05) which means there is no relationship between pregnancy exercise with stress levels in pregnant women at the Plaju Health Center in Palembang.

3.3 Multivariate Analysis

Initial Modeling (Full Model)

initial modeling (full model) is a step that is carried out to include all research variables. The

following is the initial multivariate modeling serving table, namely:

3.3 Early Modeling Table (Full Model) Multivariate Analysis

Variabel	*p-value*	PR *Crude*	95% CI *Lower*	95% CI *Upper*
Physical activity	0,027	2,345	1,101	4,994
Age Of Pregnancy	0,032	2,518	1,084	5,849
Occupation	0,040	2,103	1,000	4,420
Income	0,247	1,543	0,741	3,216
Disease History	0,019	3,247	1,218	8,656

Based on Table 3.3 it is known that physical activity has a p-value = 0.027 that value is smaller than α (0.05). This shows that there is a significant relationship between physical activity and stress levels in pregnant women after being controlled by several variables suspected as confounding variables (PR = 2.345; 95% CI = 1,101 - 4,994).

Change in Prevalence Ratio (PR) Confounding testing is carried out to find out the variables that affect physical activity on stress levels, by issuing variables that are suspected as confounders that have a p-value> 0.05, then calculating the change in PR on the main independent variable. If the variable that has been released causes a change in PR ≥ 10% in the main independent variable, then the variable that has been issued is proven to be a confounding variable, but if the main independent variable experiences a PR change of <10%, then the variable is not a confounding variable.

Table 3.4 Table n changes in PR for variables that affect physical activity on stress levels.

Variable	Physical activity PR *Crude*	Physical activity PR *Adjusted*	Change in PR Value (%)	information
Physical activity	2,345	2,225	5,117	Not *confounding*
Occupation	2,103	2,195	4,375	Not *confounding*
Age Of Pregnancy	2,518	2,509	0,357	Not *confounding*
Disease History	3,247	3,129	3,634	Not *confounding)*

Based on the Table 3.4 it is known that the income variable which has a p-value> 0.05 has been excluded from modeling but does not cause changes in PR ≥10% means the non-confounding variable and is not related to physical activity on stress levels in pregnant women at Plaju Health Center Palembang.

Final Model

The final model is presented to find out the most dominant variables from the multivariate analysis in the Physical Activity research on Stress Levels in pregnant women at Plaju Palembang Health Center

Table 3.5 Table of the Final Model (Final Model) Multivariate Analysis

Variable	*p-value*	PR *Adjusted*	95% CI *Lower*	95% CI *Upper*
Physical Activity	0,048	2,225	1,006	4,076
Age Of Pregnancy	0,028	2,509	1,106	5,692
Occupation	0,030	2,195	1,081	4,456
Disease History	0,019	3,129	1,210	8,089

Based on Table 3.5 it is known that the p-value of physical activity is 0.048 which means that Ho is rejected because the value is smaller than the value of α (0.05), thus indicating that there is a significant relationship between physical activity and Stress Level after being controlled by

variablesconfounding such as gestational age, occupation and disease history (PR = 2,025, 95% CI = 1,006 - 4,076).

4. DISCUSSION

4.1 Stress Levels with Physical Activity in Pregnant Women at PuskesmasPlaju Palembang

In the study, a bivariate test between stress levels and total physical activity on pregnant women obtained a P. value of 0.035 (p-value <0.05), which means there is a relationship between physical activity and stress levels in pregnant women at the Plaju Health Center in Palembang. The value of Prevalence Ratio (PR) shows 1,988 means that pregnant women who have physical activity are at risk 1,988 times more likely to experience stress than pregnant women who have normal physical activity (95% CI = 1,044-3,786). The population is believed to be 95% that pregnant women who have physical activity are more at risk of experiencing stress than pregnant women who have normal physical activity with a range of 1,044 to 3,786. Total excess physical activity here refers to physical activity in pregnant women, namely permanent physical activity (70.5%), mild physical activity (78.2%), moderate physical activity (64.9%), heavy physical activity (53, 5%), household physical activity (70.5%), work physical activity (60.9%), and physical sports activity (62%). This is in line with the theory of physical activity defined as body movements produced by contraction of skeletal muscles and can increase the body's energy. This physical activity encompasses a variety of body movements ranging from mild, permanent, moderate, heavy, household, work and sports activities. Some researchersrecommend that motherpregnant do regular physical exercise during pregnancy, but physical activity is carried out in excess and makes pregnant women tired can cause disruption of blood pressure so that the occurrence of fatigue both physically and psychologically(Bobak, 2014)

The results of this study are in line with the results of the study (Syahitdah, Rohmah and Nissa, 2017) published in the Indonesian Journal of Nutrition, namely that physical activity has a significant relationship to diastolic blood pressure (p <0.05). This research shows that it means the higher / excess physical activity the higher the diastolic blood pressure. This blood pressure study is influenced by the condition of someone who tends to experience stress. So it can be concluded that if excessive physical activity can create sustained stress resulting in the hormone adrenaline is released then it will increase heart rate so that blood pressure rises resulting in hypertension. Stress conditions increase sympathetic nerve activity which then increases blood pressure gradually, meaning that stress is feeling tired, afraid and anxious from one's body's feelings about changes in their environment. Naturally under these conditions a person will feel a faster heartbeat and cold sweats to flow to the nape of the neck, anxiety, fear, stress, to the feeling of hopelessness that is felt.

The results of this study are also in line with the results (Idalia Garza Veloz, 2017) involving 321 pregnant women in Mexico found that excessive physical activity in pregnant women causes stress (social dysfunction, acute somatic disorders, anxiety and

Insomnia) can be at risk of gestational hypertension, pre-eclampsia to eclampsia in pregnant women. Pre-eclampsia is a complex condition associated with significant pathological

changes in maternal and fetal blood vessels and the placenta, including decidua arteriolopathy, infarction, ischemic changes and abruption, therefore it is not surprising that perinatal outcomes are influenced by this syndrome, especially in this case. Other pre-eclampsia is commonly associated with placental lesions. Underlying vascular manifestations, and the presence of oxidative stress and endothelial damage affect uteroplacental circulation and cause fetal growth restriction with hypoxia that underlies acidosis. In infants will cause prematurity birth which gives the impact of asphyxia, low birth weight, and other complications resulting in death while in preeclampsia mothers can occur eclampsia (pregnancy spasms) which results in death(Sembiring *et al.*, 2018).

4.2 Stress Levels with Age in Pregnant Women at PuskesmasPlaju Palembang

The age of pregnant women in this study is high risk, that is <17 years and> 35 years there are 32 (20.5%) of which> 35 years are 35 pregnant women and <17 years ie 1 pregnant woman aged 15 years. For the age of pregnant women with low risk with age categories between 17-35 years there were 124 (79.5%) of the total 156 respondents of pregnant women in the public health center in Palembang. But in this study it was found that the statistical test results obtained a p-value of 0.918 (p-value> 0.05) which means there is no relationship between the age of pregnant women and the level of stress in pregnant women at the Plaju Health Center in Palembang.

Pregnancy does indeed affect the cause of maternal death from reproductive factors. In the healthy reproduction period, it is known that the age of pregnant women at risk is <17 years and> 35 years. Pregnant women aged <17 years can cause many problems because it can affect organs such as the uterus, even babies born can be premature and low birth weight babies. This is caused because women who become pregnant at a young age have not been able to supply food properly from their bodies to the fetus (marmi, 2012). Pregnancy at this age will also cause fear of pregnancy and childbirth, this is because at this age the mother is not ready to have children and the reproductive organs are not ready for pregnancy (prawihardjo, 2008)(Prawihardjo, 2012).

Age> 35 years will cause anxiety to pregnancy and childbirth and maternal reproduction equipment too old and have a great tendency for the occurrence of high maternal blood pressure so that it can result in conditions of preeclampsia to hypertension in pregnant women which can cause bleeding and early labor. (kristyanasari, 2010). Conditions of anxiety and fear based on the results of previous studies This is not in line with this study because this study found that there was no effect between the age of pregnant women with stress levels. Because based on the condition in the study of pregnant women with age <17 years only 1 person is found that is the age of 15 years after conducting research in the stress level questionnaire interview obtained mild stress level category due to forms of anxiety, fear and anxiety caused by giving birth to the first child. At the age of> 35 years found 31 people with only 18 people who have stress. 18 of those pregnant women indicated stress because they had a history of illness or certain medical recordscause respondents to experience anxiety, fear, anxiety until the indicated mild stress category. Parties have also marked the health center by giving a yellow medical card (motherpregnant who have certain medical records or history).

In pregnant women who do not have medical records but at age at risk of pregnancy there are 14 pregnant women and do not experience stress due to the results of research through questionnaires that they are accustomed to being pregnant with the meaning of not giving birth to their first child plus they have no complaints or history of certain diseases so indicated no stress and tends to enjoy the process of pregnancy.
In pregnant women aged 17-35 years, 71 stressed pregnant mothers and 53 stressed non-pregnant women due to stress in pregnant women due to other factors namely excessive physical activity, work, income, gestational age, history of illness or pregnancy exercise.

4.3 Stress Level with Pregnancy Age for Pregnant Women at PuskesmasPlaju Palembang

In the statistical test results obtained p-value of 0.002 (p-value <0.05) which means there is a relationship between gestational age and stress levels in pregnant women at the Plaju Health Center in Palembang. The value of Prevalence Ratio (PR) shows 3,300, meaning that pregnant women with trimester 3 gestational age are 3,300 times more likely to experience stress than pregnant women with trimester 2 gestational age (95% CI = 1,522-7,153). The population is believed to be 95% that pregnant women with trimester 3 gestational age are at risk for experiencing stress compared to pregnant women with gestational age trimester 2 with a range of 1.522 to 7.153.
Physiological changes that occur during pregnancy, have a pathological impact on pregnant women. In the second trimester the body of pregnant women has begun to adapt to nausea and vomiting, but in the third trimester complaints due to enlargement of the stomach, anatomical changes and hormonal changes will cause complaints in pregnant women (Annemarie Hennessy, S. Ananth Karumanchi, 2017)
These complaints include low back pain, shortness of breath, varicose veins, haemorrhoids, sleep disorders and are definitely psychologically experiencing anxiety, fear, anxiety until feeling depressed to cause stress in some pregnant women (Kang *et al.*, 2016). Pregnant women with trimester 3 the number of sleep disorders is higher because of discomfort such as low back pain, urinating a lot so that spontaneously awakening from sleep. Fetal movements cause heartburn, cramps in the legs, fatigue and difficulty starting sleep or difficulty sleeping until morning. (Grace, 2003)
This is in line with this study that pregnant women with trimester 3 tend to be at risk of stress. This is also related to the theory of anxiety, fear, anxiety, stress that arises and is sometimes influenced by pathophysiological conditions that arise due to pregnancy and psychologically suggested changes in responsibility to parents, childbirth will be faced up to the concerns of the economy in children. (Zanto *et al.*, 2011)

4.4 Levels of Stress with Work for Pregnant Women at PuskesmasPlaju Palembang

Based on the statistical test results obtained p-value of 0.001 (p-value <0.05) which means there is a relationship between work and stress levels in pregnant women at the Plaju Health Center in Palembang. The value of the Prevalence Ratio (PR) shows the number 2.914 means that pregnant women who work at risk are 2,914 times higher to experience stress than pregnant women who do not work (95% CI = 1,511-5,620). In the population it is believed that 95% of working pregnant women are at risk of experiencing stress compared to non-

working pregnant women with a range of 1,511 to 5,620.

The data of this study found 86 pregnant women (55.1%) of whom 42 employees included: 10 private employees, 2 bank employees, 4 Pertamina employees, 7 lecturers, 7 teachers, 2 policewomen, PNS 4 people, 3 nurses, SPG 3 people. While 44 entrepreneurs include: 3 people washing workers, 1 person souvenir craftsman, 1 person handlers, 39 traders. and 70 (44.9%) non-working pregnant women in the Palembang public health clinic. This is in line with research (Syahitdah, Rohmah and Nissa, 2017). There is a significant relationship between work and stress, due to the type and duration of work affecting stress and blood pressure. The effects of stress due to work will stimulate the adrenal glands to secrete the hormone adrenaline which can trigger heart rate faster. The impact is an increase in blood pressure. In this study also showed that there were 59 (68.6%) pregnant women who worked experiencing stress.

Other research, namely research (iskandar, 2019)states that shows that there is a relationship between workload and pregnancy steressor. Characteristics of work can be a stressor including work or physical activity in managing the household, work that requires a long standing of more than 6 hours / day, working hours more than 42 hours per week, mothers who work all the time can cause physical and psychological pressure so that it can cause stress to depression so that it contributes to complications during pregnancy. Because of the nature of pregnant women at work while not in a state of pregnancy with pregnant women who work in conditions of pregnancy has given a pathological and psychosocial burden on pregnant women.

4.5 Stress Levels with Household Income for Pregnant Women at PuskesmasPlaju Palembang

In this study, the statistical test results obtained p-value of 0.018 (p-value <0.05) which means there is a relationship between income and stress levels in pregnant women at the Plaju Health Center in Palembang. The value of Prevalence Ratio (PR) shows 2,173 meaning that pregnant women who have an income <UMR are 1,433 times higher risk of experiencing stress than pregnant women who have an income> UMR (95% CI = 1,136-4,156). The population is believed to be 95% that pregnant women who have an income <UMR are at risk of experiencing stress compared to pregnant women who have an income> UMR with a range of 1.136 to 4.156.

Data Details of the research results obtained household income of pregnant women <UMR 89 (57.1%), household income of pregnant women> UMR 67 (42.9%) household income of pregnant women <UMR more than household income that > UMR because more pregnant women who do not work compared to pregnant women who work, in pregnant women who do not work get some income> UMR this is caused by the income of her husband who is indeed> UMR, while pregnant women who work do get also some whose income is <UMR although it has been added to their husband's income. The UMR of Palembang City is Rp. 2,804,453.

These results are in line with research (Sophia, 2019) in the Journal of Averrous Vol.5 No.1 that concerns about financial problems have a very significant relationship with complications in pregnant women who are affected by stressful conditions. Pregnant women who experience stress due to financial or income concerns in the study in

the North Aceh working area reach 4,282 times the risk of pregnancy complications. Stress during pregnancy is closely related to the occurrence of premature labor that is at risk of depression until after delivery. Stress in pregnant women is very complex, one of which is economic factors. Economic factors are a supporting factor rather than the survival of one's life. This is related to the fact that at the time of the study it was found that some pregnant women were concerned about the issue of childbirth funds which at this time were not cheap because they did not use health insurance to finance other children in terms of food, housing and tertiary. Competitive modern life would lead to conditions of economic hardship so that it can trigger chronic stress, if not overcome by coping or the right way will interfere with homeostasisin controlling cortisol levels. This can also be influenced by how pregnant women deal with stress because each pregnant woman is also different in dealing with their stress.

4.6 Stress Level with Parity Status in Pregnant Women at PuskesmasPlaju Palembang

This study obtained statistical test results obtained a p-value of 0.489 (p-value> 0.05) which means there is no relationship between parity and stress levels in pregnant women at the Plaju Health Center in Palembang. With detailed data on parity status or the number of children in pregnant women it is found that there are more than 1 children (multipara) as many as 56 (35.9%), while pregnant women who have their first child (primipara) as many as 100 (64.5%). With multiparous pregnant women experiencing stress is 34 (60.7%).The results in this study are in line with research (Sembiring 2018) that parity status has a significant relationship to the risk of stress in pregnant women and the risk of developing pre-eclampsia. This research shows that stress is influenced by the condition of fear, anxiety caused by giving birth to the first child and fear of death during labor. This supports 80% of all cases of pregnancy complications (3-8%) occurring in primiparous parity status.

4.7 Stress Level with a History of Disease in Pregnant Women at PuskesmasPlaju Palembang

Statistical test results obtained a p-value of 0,000 (p-value> 0.05) which means there is a relationship between the history of the disease and the stress level in pregnant women at the Plaju Health Center in Palembang. The value of the Prevalence Ratio (PR) shows the number 4.581 means that pregnant women who have a history of chronic disease are 4.581 times higher risk of experiencing stress than pregnant women who have no history of chronic disease (95% CI = 1.870-11.224). The population is believed to be 95% that pregnant women who have a history of chronic disease are at risk of experiencing stress compared to pregnant women who have no history of chronic diseases with a range of 1,870 to 11,224. With detailed data based on the results of the history of the disease obtained by pregnant women who have a history of chronic disease as many as 38 (24.4%). The diseases obtained in this study were 5 people with asthma, 18 people with hypertension, 13 people with Maagh, 2 people with diabetes mellitus, while mothers there were 118 (75.6%) pregnant women with no chronic chronic disease at the Plaju Palembang Public Health Center. This is in line with research (Sembiring, 2018) that pregnant women who have mild stress have a tendency to experience hypertension 4 times compared to non stressed pregnant women. Stress-related steroid resistance can disrupt the

hypothalamus-pituitary-adrenal axis thereby increasing the uterine artery resistance index. Increased oxygen demand in the body will increase arterial pressure and heart frequency so that peripheral blood vessels experience vasoconstriction, an increase in blood pressure in pregnant women (Sembiring *et al.*, 2018)(Asthma is a disease that often provides significant medical complications in pregnancy. About 4-8% of pregnancies have asthma complications. The prevalence of asthma morbidity continues to increase from year to year even though the mortality rate has decreased. The severity of asthma in patients during pregnancy is often exacerbated by the risk factor for asthma, stress, so patients need asthma medications used (Folkman, S., & Lazarus, 1985)

Diabetes Militus or commonly referred to as diabetes during normal pregnancy, women experience short insulin resistance and glycemia after eating. Increased sugar consumption in pregnant women causes hyperglycemia. But in pregnant women with a history of type 2 diabetes mellitus the risk of pre-eclampsia is 4 times higher than for pregnant women without a history of diabetes mellitus.

Based on the conditions in this study pregnant women who have a medical history record tend to have stress due to anxiety, fear and anxiety at the time of the condition every day,the condition at the time of labor took place until it was very worried about the condition of the fetus it was carrying.Assuming each mother's mind whether there is no problem they consume these drugs for the fetus.

4.8 Stress Levels with Pregnancy Exercise in Pregnant Women at PuskesmasPlaju Palembang

Statistical test results obtained a p-value of 0.760 (p-value> 0.05) which means there is no relationship between pregnancy exercise with stress levels in pregnant women at the Plaju Health Center in Palembang. Details of the data based on the results of research in the Public Health Center in Plaju found that more pregnant women who did not take part in the exercise were 141 people (90.4%) while 15 women (9.6%) participated in the exercises. This is related to the lack of socialization of pregnancy exercises held by puskesmas and the lack of activeness of pregnant women regarding the importance of pregnancy exercises. Pregnancy exercise is a form of exercise or structured exercise. Exercise has the benefits of reducing stress during pregnancy, increasing fetal and placental growth in the first and second trimester, reducing the incidence of complications in pregnancy, easing labor, reducing back pain, enhancing physical and psychological health, providing comfort or relaxation, and mastering techniques in breathing from pregnancy to childbirth (iskandar, 2019)(Wahyuni, 2013)

But in the study it was found that pregnant women who followed gymnastics but remained stressed there were 8 people (53.3%) this was due to the fact that pregnant women had participated in gymnastics but only occasionally and not routinely so that it did not have a comprehensive effect for the pregnant women. Sometimes delays in information obtained by pregnant women so that they do not follow the gymnastic agenda, coupled with in this study many respondents of pregnant women who work so that the lack of time to attend gymnastics is reduced because of the tight work schedule. In the data of pregnant women who are gymnastic and not stressed, there are 7 people (46.7%) of these mothers

who have been doing routine exercises and other sports.

There are some who do have a pregnancy exercise community at the nearest clinic from their home. So that the effects of routine exercise done by pregnant women have an impact on the reduction of complaints during pregnancy, including stress not indicated.

The majority of data on pregnancy exercises for pregnant women in this study are pregnant women who do not exercise and indicated stress as many as 82 people (58.2%) according to Whulandari (2006) that this exercise is an effective prenatal service to reduce the anxiety of pregnant women in facing constraints when pregnancy so that there should be differences in pregnant women who follow gymnastics and pregnant women who do not follow gymnastics on the stress level of pregnant women. But in this study it was given that 59 people (41.8%) did not follow gymnastics and they were not indicated stressed. This explains that the obstacles during pregnancy for each pregnant woman are different as well as stress control during pregnancy for each pregnant woman.

4.9 Multivariate Analysis

Multivariate analysis was carried out to determine which independent variables had the greatest influence on the dependent variable of the analysis used was a multiple logistic regression test. The analysis used in this study is multiple logistic regression with the Backward LR method.This multivariate analysis is a follow-up to the bivariate test. Statistically significant variables ($p < 0.05$), and having p values <0.25 included in the analysis process. Based on table 4.21 we get a logistical equation model for predicting stress events in pregnant women:

Occurrence of Stress = -0,928 + 0,920 (Age of Pregnancy) + 0,786 (Occupation) + 1,141 (History of Disease) + 0,706 (Total Physical Activity)

ce of stress in pregnant women is influenced together by factors of gestational age, occupation, history of illness, total physical activity.

Model Prediction / Probability of Bound Variables. To determine the probability of stress occurring in pregnant women, the formula used is:

$$P = 1/(1+e^{-y})$$

Information

P = probability for stress to occur

e = natural number = 2.7

y = constant + a1x1 + a1x2 + ...aixi

a = coefficient value of each variable

x = value of the free variable

The probability of stress occurrence in pregnant women at the Plaju Palembang Public Health Center is:

y = -0,928 + 0,920 (Age of Pregnancy) + 0,786 (Occupational) + 1,141 (History of Disease) + 0,706 (Total Physical Activity)

y = -0,928 + 0,920 (1) + 0,786 (1) + 1,141 (1) + 0,706 (1)

y = 1,484

The results of calculating the probability of a stressful event if you have the risk factors above are:

p = 1 / (1 + e-y) = 1 / (1 + 2.7- (1,484))

p = 0,814

p = 81,4%

Based on the above calculation, the probability of a pregnant woman in Plaju Palembang Public Health Center experiencing stress is 81.4 percent if she has a trimester of 3 gestational age, works, has a history

of chronic illness, has excessive total physical activity.

5. CONCLUSION

The results of the analysis of Physical Activity Against Stress Levels in Pregnant Women in PuskesmasPlaju Palembang:

- 1. Factors that influence the level of stress in pregnant women in the work area of Plaju Palembang Health Center are total physical activity, age of pregnant women, gestational age, level of education, type of work, total income, parity status, pregnancy exercise and history of illness.

  2. The results of the analysis of the relationship between physical activity and stress levels are
  - There is a significant relationship between total physical activity, gestational age, occupation, income and history of illness to stress levels in pregnant women at the PuskesmasPlaju Palembang
- There is no significant relationship between the age of pregnant women, parity status and pregnancy exercise on the level of stress in pregnant women at the PuskesmasPlaju Palembang

3 Factors that most influence the level of stress in pregnant women at the Plaju Palembang Health Center are total physical activity, gestational age, occupation, and history of the disease.

ETHICAL APPROVAL

This research was conducted after obtaining approval from the Health Research Ethics Committee of the Faculty of Public Health, Sriwijaya University. The aim is to ensure that the research proposed is ethically acceptable and that the welfare and rights of research participants are protected.

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